CLAIMS

We claim:

1. A polynucleotide comprising:

a) a first nucleic acid encoding a CD8 α-chain operably linked to nucleic acid encoding a transmembrane polypeptide; and

b) a second nucleic acid comprising a therapeutic gene of interest; and

c) at least a first transcription and translational control element for directing expression of said first and second nucleic acid.

2. The polynucleotide according to claim 1, wherein said nucleic acid encoding a CD8 α-chain has greater than 80% sequence identity to the nucleic acid encoding the human CD8 α-chain as set forth in Figure 1 (SEQ ID NO: ).

3. The polynucleotide according to claim 1, wherein said nucleic acid encoding a CD8 α-chain has greater than 80% sequence identity to the nucleic acid encoding the mouse, rat, or porcine CD8 α-chain as set forth in Figure 1 (SEQ ID NOS: ).

4. The polynucleotide according to claim 3, wherein said nucleic acid encoding a CD8 α-chain comprises the mouse, rat, or porcine CD8 α-chain as set forth in Figure 1 (SEQ ID NOS: ).

5. The polynucleotide according to claim 1, wherein said CD8 α-chain comprises the sequence selected from the group consisting of the sequences set forth in Figure 1 SEQ ID NO: .

6. The polynucleotide according to claim 1, wherein said CD8 α-chain lacks the intracellular domain of wild-type CD8 α-chain.

7. The polynucleotide according to claim 1, wherein said therapeutic gene of interest is selected from the group consisting of hemoglobin-β, GATA-binding protein, d-aminoevulinate synthase, glucose-6-phosphate-dehydrogenase, Coagulation Factor VIII, Coagulation Factor XI, cystic fibrosis transmembrane conductance regulator, ornithine carbamoyl transferase, α-L-iduronidase, iduronate-2-sulfatase, β-glucosidase, α-galactosidase, galactosylceramidase, acid α-glucosidase, hexamidase A, phenylalanine

hydroxylase, collagen type IV, α5, Bloom Sundrome Gene Product, and low density lipoprotein receptor.

8. The polynucleotide according to any one of claims 1 to 7, wherein said polynucleotide comprises a vector.

9. The polynucleotide according to claim 8, wherein said vector is selected from the group consisting of a recombinant adenovirus, a recombinant retrovirus, a recombinant adeno-associated virus, and a recombonant herpes virus.

10. The polynucleotide according to claim 9, wherein said vector is replication defective.

11. A composition comprising the polynucleotide according to any one of claims 1, 2, 3, 4, 5, ,6 or 7, further comprising liposomes.

12. A method for reducing immune response against antigens derived from a gene therapy delivery system comprising:

a) contacting a cell with said gene therapy delivery system, wherein said gene therapy delivery system comprises:

i) a first nucleic acid encoding a CD8 α-chain operably linked to nucleic acid encoding a transmembrane polypeptide; and

ii) a second nucleic acid comprising a therapeutic gene of interest; and

iii) at least a first transcription and translational control element for directing expression of said first and second nucleic acid, whereby said first and second nucleic acids are expressed, whereby the expressed CD8 α-chain is associated with the cell membrane of said cell, and whereby a host immune response against said cell is diminished as compared to the immune response against a cell without the CD8 α-chain encoding nucleic acid.

13. The method according to claim 12, wherein said gene therapy delivery system is selected from the group consisting of a viral expression vector, a plasmid and a naked nucleic acid expression vector.

14. The method according to claim 13 wherein said viral expression vector is selected from the group consisting of of a recombinant adenovirus, a recombinant retrovirus, a recombinant adeno-associated virus, and a recombinant herpes virus.

15. The method according to claim 12 wherein said therapeutic gene of interest is selected from the group consisting of hemoglobin-β, GATA-binding protein, d-aminoevulinate synthase, glucose-6-phosphate-dehydrogenase, Coagulation Factor VIII, Coagulation Factor XI, cystic fibrosis transmembrane conductance regulator, ornithine carbamoyl transferase, α-L-iduronidase, iduronate-2-sulfatase, β-glucosidase, α-galactosidase, galactosylceramidase, acid α-glucosidase, hexamidase A, phenylalanine hydroxylase, collagen type IV, α5, Bloom Sundrome Gene Product, and low density lipoprotein receptor.

16. The method according to claim 12, wherein said nucleic acid encoding CD8 α-chain comprises the sequence set forth in Figure 11 (SEQ ID NO: ).

17. The method according to claim 12, wherein said nucleic acid encoding CD8 α-chain encodes a protein having a sequence as set forth in Figure 10 (SEQ ID NO: ).